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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,934	10/19/2001	William H. Bushong	780396.91470	4823

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QUARLES & BRADY LLP  
411 E. WISCONSIN AVENUE  
SUITE 2040  
MILWAUKEE, WI 53202-4497

EXAMINER

PARSONS, THOMAS H

ART UNIT PAPER NUMBER

1745

DATE MAILED: 04/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/045,934

Applicant(s)

BUSHONG ET AL.

Examiner

Thomas H Parsons

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) 24-54 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☒ Claim(s) 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5,6,8,9,10,11.
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-23, drawn to a rechargeable electrochemical cell, classified in class 429, subclass 59.
  - II. Claims 24-33, 47-52, drawn to a rechargeable electrochemical cell recharging system, classified in class 320, subclass 137.
  - III. Claims 34-46, 53-54, drawn to a method of recharging a rechargeable cell, classified in class 320, subclass 137.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require the particulars of the endcap assembly. The subcombination has separate utility such as a power supply for electrical appliances or other consumer products.
3. Inventions II and III are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another

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materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the process can be practiced by another materially different apparatus such as one configured to supply a constant current, or such as an electrical capacitor.

4. Inventions 1 and III are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the process can be practiced by another materially different apparatus such as one configured to supply a constant current, or such as an electrical capacitor.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Groups II and III, restriction for examination purposes as indicated is proper.

7. During a telephone conversation with Attorney Adam Forman on 5 April 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-23. Affirmation of this election must be made by applicant in replying to this Office action. Claims 24-54 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

8. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### *Drawings*

9. The drawings are objected to because the lead line from reference sign "28" on Figure 2A is leading for a different structure than the lead line from reference sign "28" on Figure 2B. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

10.

### *Specification*

11. The disclosure is objected to because of the following informalities:

Page 8, line 20, suggest deleting the extra period after "threshold";

Page 12, line 9, suggest changing the second occurrence of "open" to --closed--;

Page 13, line 2, suggest deleting "has"; and,

Page 33, line 26, suggest deleting "the" before "rate";

Appropriate correction is required.

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12. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The specification fails to provide proper antecedent basis the instantly claimed “a flexible member”.

***Claim Objections***

13. Claim 10 objected to because of the following informalities:

line 5, suggest replacing the semicolon with a period.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 1-3, 5, 7-8, and 15-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Epstein (4,034,552).

**Claim 1:** Epstein in the Figure discloses an axially extending rechargeable electrochemical cell (10) comprising: (a) an outer can (case 14) defining an internal cavity (16) with an open end, a positive and negative electrode (18, 20) disposed in the internal cavity, and a terminal end cap (26) enclosing the open end; and (b) an end cap assembly (12) including:

i. a flexible member (diaphragm 34) extending radially inwardly from the can, wherein the flexible member from a first position towards a second position in response to internal cell pressure;

ii. a first conductive element (32) in electrical communication with the terminal end cap (26);

iii. a second conductive element (30) in electrical communication with the positive electrode (18 or 20), and in removable electrical communication with the first conductive element (32), wherein the second conductive element (30) is in mechanical communication with the flexible member (via spring 36); and

wherein the first (32) and second (30) conductive elements are removed from electrical communication when the flexible member (diaphragm 34) flexes towards the second position in response to an internal pressure exceeding a predetermined threshold during charging. (See col. 3: 32-col. 4: 39).

Although the Figure shows anode 18 and cathode 20, the recitation on col. 3: 1-4 "...at least a portion of which serves as a first terminal associated with one of the electrodes, a second terminal associated with the second electrode..." has been construed as a teaching that one skilled in the art could select which electrode will be the anode and which electrode will be the cathode. Accordingly, the apparatus of Epstein could be configured such that the second conductive element is the positive electrode.

**Claim 2:** Epstein discloses that the flexible member (diaphragm 34) returns to the first position from the second position when the internal pressure drops below the predetermined threshold. (See col. 3: 12-19 and col. 4: 40-43 which has been construed to mean that

interruption of the cell discharge will continue only until the excessive condition is dissipated after which the cell is reactivated (i.e. the diaphragm 36 returns to its first position.)

**Claim 3:** Epstein discloses in the Figure that the second conductive element (30) is connected to the flexible member (diaphragm 34) and at least partially axially aligned (i.e. along the x axis) with the first conductive element (32), and wherein the second conductive element (30) is displaced axially outwardly (i.e. along the y-axis) when the flexible member is in the second position. (See col. 3: 32-col. 4: 39).

**Claim 5:** Epstein in the Figure discloses that the flexible member defines a radially inwardly extending cavity at its periphery (i.e. the area between the cover 13 and the diaphragm 34), the cavity including distal ends of the end cap and first conductive element. (See col. 3: 32-col. 4: 39).

**Claim 7:** Epstein in figure 1 discloses that the terminal end cap (26) is a positive terminal end cap. (See col. 3: 32-col. 4: 39).

**Claim 8:** Epstein in the Figure discloses a stop washer (seal 35) disposed axially downstream of the first conductive element (32) for limiting axial movement of the first conductive element when the flexible member is in the second position. (See col. 4: 1-4.)

**Claim 15:** The limitation recited therein has been construed as being directed toward the manner in which the cell is to be operated, and does not further limit the overall physical structure of the apparatus. However, because the apparatus of the Epstein combination is structurally similar to what is instantly claimed, it would appear capable operating as instantly claimed.

**Claim 16:** The rejection of claim 16 is as set forth above in claim 15.



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**Claim 17:** The rejection of claim 17 is as set forth above in claim 15.

**Claim 18:** The rejection of claim 18 is as set forth above in claim 15.

**Claim 19:** The rejection of claim 19 is as set forth above in claim 15.

**Claim 20:** The rejection of claim 20 is as set forth above in claim 15.

**Claim 21:** The rejection of claim 21 is as set forth above in claim 15.

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epstein.

**Claim 4:** Epstein in the Figure discloses a **nonconductive** spring member disposed between the terminal cap and the flexible to limit the amount of flexible member displacement and to impose a pre-disposed spring force for maintaining contact between the first and second conductive elements. The Figure shows a member extending from apex 36a to rivet post 26; this member has been construed as a string member because it is structurally performing the same function as instantly claimed. Further. Although it is not explicitly disclosed as nonconductive, it would have been obvious to one skilled in the art to expect this member to be nonconductive because a conductive member would create a current path between the positive terminal and the negative can thereby causing internal short-circuiting.

18. Claims 6 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Epstein as applied to claims 5 and 1 above, and further in view of Belove (3,622,397).

Epstein is as applied, argued, and disclosed above, and incorporated herein.

**Claim 6:** Epstein does not disclose that the can is crimped over the flexible member to seal the open end of the cell.

Belove in Figure 1 discloses a can (11) is crimped over a flexible member (51) to seal the open end of the cell. (See col. 2: 24-41.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the can of Epstein by incorporating the crimp of Belove because Belove teaches a crimp that would have provided a leak tight insulating seal thereby improving the overall life, structural integrity, and performance of the battery.

**Claim 10:** Epstein discloses in the Figure a flexible member (diaphragm 34) separating the internal cavity (16) of the can (14) from a second internal cavity disposed within the end cap. Epstein does not disclose that the cell further comprises an opening extending through the flexible member to provide a conduit between the internal cavity of the can and the second internal cavity.

Belove in Figure 3 discloses an opening extending (81) through a flexible member (51) to provide a conduit between the internal cavity of the can and the second internal cavity. (See col. 5: 29-col. 6: 32.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the flexible member of Epstein by incorporating the opening of Belove because Belove teaches an opening that would have permitted the release of

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excess pressure buildup beyond a maximum danger level thereby protecting the battery against damage from excess pressure and improve the overall life, performance and safety of the battery.

**Claims 11 and 12:** Epstein does not disclose a plug.

Belove in Figure 3 discloses a plug (82) disposed within the opening that is displaceable when the internal pressure reaches a second predetermined threshold, wherein the plug is elastically deformable. (See col. 5: 29-col. 6: 32.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the flexible member of Epstein by incorporating the plug of Belove for reasons as set forth above in claim 10.

**Claim 13:** Epstein does not disclose a spring.

Belove in Figure 3 discloses a spring member (82) disposed within the opening operable to prevent fluid from flowing from the internal cavity of the can from the second internal cavity, wherein the spring member is displaceable when the internal pressure reaches a second redetermined threshold. (See col. 5: 29-col. 6: 32.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the flexible member of Epstein by incorporating the spring member of Belove for reasons as set forth above in claim 10.

**Claim 14:** The limitation “wherein the cell is chargeable under a constant current charge” has been construed as being directed toward the manner in which the cell is to be operated, and does not further limit the overall physical structure of the apparatus. However, because the apparatus of the Epstein combination is structurally similar to what is instantly claimed, it would appear capable operating as instantly claimed.

19. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epstein as applied to claim 1 above, and further in view of Vu et al. (5,691,073).

Epstein is as applied, argued, and disclose above, and incorporated herein.

**Claim 9:** Epstein does not disclose an aperture an aperture extending through the terminal end cap configured to permit gasses to escape from the cell when the internal pressure exceeds the predetermined threshold.

Vu et al. in Figure 1 disclose an aperture (vent hole 67) extending through the terminal end cap configured to permit gasses to escape from the cell when the internal pressure exceeds the predetermined threshold. (see abstract, col. 2: 32-35 and 52-56, and col. 5: 44-46).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the can of Epstein by incorporating the aperture of Vu et al. because Vu et al. disclose an aperture that would have provided a means for minimizing pressure buildup in the cell during exposure to high temperatures, excessive or improper charging, or short circuiting thereby improving the overall life and performance of the battery.

20. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epstein as applied to claim 1 above, and further in view of Horn et al. (3,097,975).

Epstein is as applied, argued and disclosed above, and incorporated herein.

**Claim 22:** Epstein in the Figure discloses a separator (22) disposed between the positive (2) and negative (18) electrodes. Epstein, however, does not disclose that the separator is gas impermeable.

Horn et al. discloses batteries comprising separator disposed between the positive and negative electrodes wherein the battery is gas impermeable.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the separator of Epstein with the separator of Horn et al. because Horn et al. teaches a gas impermeable separator that would have provided improved absorptivity and electric resistance thereby reducing the danger of internal short circuits and increasing the useful life space of the cell.

***Allowable Subject Matter***

21. Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Reasons for Indicating Allowable Subject Matter***

22. The following is a statement of reasons for the indication of allowable subject matter:

Epstein discloses a second conductive elements comprising a first contact having one end extending from the positive terminal, and a second end opposite the first end wherein the second end contacts the first conductive element.

In contrast, the instantly claimed second conductive element comprises: a first contact having one end extending from the positive electrode, and a second end opposite the first end; a second contact extending through the flexible member having a first end in contact with the second end of the first contact, and a second end opposite the first end; and a third contact having

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a first end in contact with the second end of the second contact, and a second end opposite the first end and in removable contact with the first conductive element.

Neither Epstein nor the prior art of record teach or suggest the structure of the instantly claimed second conductive element comprises three contacts.

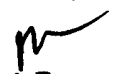
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas H Parsons  
Examiner  
Art Unit 1745

\*\*\*

  
Patrick Ryan  
Supervisory Patent Examiner  
Technology Center

<b>Interview Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/045,934	BUSHONG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Thomas H Parsons	1745	

All participants (applicant, applicant's representative, PTO personnel):

- (1) Thomas H Parsons. (3)\_\_\_\_\_.
- (2) Adam Forman. (4)\_\_\_\_\_.

Date of Interview: 05 April 2004.

Type: a) ☒ Telephonic b) ☐ Video Conference  
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.  
If Yes, brief description: \_\_\_\_\_.

Claim(s) discussed: 1-54.

Identification of prior art discussed: NA.

Agreement with respect to the claims f) ☒ was reached. g) ☐ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: During a telephone conversation with Attorney Adam Forman a provisional election was made with traverse to prosecute the invention of Group I, claims 1-23.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

\_\_\_\_\_  
Examiner's signature, if required